We claim:

1. A continuous catalytic hydrogenation process, compromising recirculating a reaction mixture containing the substance to be hydrogenated, hydrogenation product, hydrogen and hydrogenation catalyst suspended in the reaction mixture in a reactor, removing part of the hydrogenation product from the reactor, mixing together the substance to be hydrogenated and the hydrogen before entering the reactor and then feeding the substance to be hydrogenated and hydrogen into the reactor.

2. The process according to claim 1, further comprising mixing of the substance to be hydrogenated and hydrogen so that the diameter of gas bubbles produced thereby is no more than 2.5 mm.

3. The process according to claim 2, further comprising mixing of the substance to be hydrogenated and hydrogen so that the diameter of gas bubbles produced thereby is less than 1.5 mm.

4. The process according to claim 1, wherein a venturi nozzle, a perforated plate or frit is used for mixing said substance to be hydrogenated and the hydrogen.

5. The process according to claim 2, wherein a venturi nozzle, a perforated plate or frit is used for mixing said substance to be hydrogenated and the hydrogen.

6. The process according to claim 3, wherein a venturi nozzle, a perforated plate or frit is used for mixing said substance to be hydrogenated and the hydrogen.

7. The process according to claim 1, wherein the substance to be hydrogenated and hydrogen form a system that is coalescence-inhibited.

8. The process according to claim 2, wherein the substance to be hydrogenated and hydrogen form a system that is coalescence-inhibited.

9. The process according to claim 3, wherein the substance to be hydrogenated and hydrogen form a system that is coalescence-inhibited.

10. The process according to claim 4, wherein the substance to be hydrogenated and hydrogen form a system that is coalescence-inhibited.

11. The process according to claim 7, further comprising wherein systems in which the sum quotient of all specific interfacial surface tensions of the components involved in the system reaches a value of at least 16 mN/m are used as the coalescence-inhibited systems.

12. The process according to claim 1, wherein the hydrogen and substance to be hydrogenated form a mixture that possesses a gas proportion of 40 vol.% to 80 vol.%.

13. The process according to claim 1, wherein the reactor is free from inserts.

14. The process according to claim 1, wherein the reactor is a stirred vessel, a gas-lift reactor, a fluidized-bed reactor or a loop reactor.

15. The process according to claim 1, further comprising using substituted anthraquinone or a mixture of substituted anthraquinones and/or ring-hydrogenated tetrahydro derivatives thereof as the substance to be hydrogenated.

16. The process according to claim 1, further comprising in that the substance to be hydrogenated is introduced as such or in solution.

17. The process according to claim 2, further comprising in that the substance to be hydrogenated is introduced as such or in solution.

18. The process according to claim 4, further comprising in that the substance to be hydrogenated is introduced as such or in solution.

19. A process for the production of hydrogen peroxide by the anthraquinone cyclic process, comprising a catalytic hydrogenation, an oxidation of the hydrogenated working solution with oxygen or an oxygen-containing gas, wherein hydrogen peroxide and substituted anthraquinone or mixture containing its ring-hydrogenated tetrahydro-anthraquinone is obtained and the hydrogen peroxide is extracted from the mixture obtained after the oxidation, in that the hydrogenation is performed by a continuous catalytic hydrogenation process wherein a substituted anthraquinone or a mixture of substituted anthraquinone and/or ring-hydrogenated tetradydro derivatives thereof is recirculated in a reactor together with hydrogenation product, hydrogen and hydrogenation catalyst suspended in the

reaction mixture, removing part of the hydrogenation product from the reactor, mixing the compound to be hydrogenated and the hydrogen together before entering the reactor and then feeding the substance to be hydrogenated and hydrogen into the reactor.

20. A process for the production of hydrogen peroxide by the anthraquinone cyclic process comprising:

continuously catalytically hydrogenating a reaction mixture containing

an anthraquinone compound selected from the group consisting of substituted anthraquinone, mixtures of substituted anthraquinones, ring-hydrogenated tetrahydro derivatives thereof and mixtures,

(b) hydrogenation product,

(c) hydrogen and

(d) hydrogenation catalyst suspended in the reaction mixture,

continuously circulating said reaction mixture in a reactor,

removing part of the hydrogenation product from the reactor,

mixing the anthraquinone compound and the hydrogen together before introduction into the reactor and then feeding the mixed anthraquinone compound and the hydrogen into the reactor,

oxidizing the hydrogenated solution with oxygen or an oxygen containing gas to thereby obtain hydrogen peroxide and substituted anthraquinone or mixture containing ring-hydrogenated tetrahydro anthraquinone,

extracting hydrogen peroxide from the reaction after oxidizing.

21. A process for the production of hydrogen peroxide by the anthraquinone cyclic process comprising:

forming a premix of an anthraquinone compound to be hydrogenated with hydrogen prior to introduction of said premix into a hydrogenation reactor,

introducing said premix into said hydrogenation reactor,

mixing said premix with a reaction mixture containing an anthraquinone compound selected from the group consisting of substituted anthraquinone, mixtures of substituted anthraquinones, ring-hydrogenated tetrahydro derivatives thereof and mixtures,

hydrogenation product,

hydrogen and

hydrogenation catalyst suspended in the reaction mixture,

continuously circulating said reaction mixture in said reactor and catalytically hydrogenating said reaction mixture together with said premix to form hydrogenation product in a hydrogenation solution

removing part of the hydrogenation product from the reactor

oxidizing the hydrogenated solution with oxygen or an oxygen containing gas to thereby obtain hydrogen peroxide and substituted anthraquinone or mixture containing ring-hydrogenated tetrahydro anthraquinone,

extracting hydrogen peroxide from the reaction after oxidizing.